Found It
Finding Lines before your Backhoe Does

South Carolina Rural Water Association
November, 2019
Introductions

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Sponsoring Organization: USABlueBook
Types of Locators

- Magnetomatic ("the Wand")
- Ferromagnetic
- Radio Transmission Locators
- Acoustic (Thumpers)
- EMS (Electronic Marking System)
- Ground Penetrating Radar (GPR)
- The BACKHOE! 😞
Magnetomatic Locators

Advantages

• Inexpensive ($3–$40)
• Locates all type of pipe, fiber optics, telephone, and electrical cable
• No power requirements
Disadvantages

- Operator experience and confidence
- Natural conditions affect
- Clothing may affect
- Disagreements on science
Operation

- Keep instrument level at all times
- Walk Slowly
- Locator will turn to point direction of pipe
- Approach from various angles
Ferromagnetic Locators

Advantages

• Low to moderate price ($300–$1000)
• Science established
• Short learning curve
• Many equipment manufacturers
Ferromagnetic Locators

Disadvantages

- Locates only ferrous type metals
- Some knowledge of system required
- Mainly used for valve or manhole covers as pipe requires some experience and practice
Ferromagnetic Locators

Operation

• Keep equipment @ 90°
• Small or deep items—increase sensitivity
• Signal strength strongest near edges of item being locates
• Fences and metal barriers require special attention and time
Radio Transmission Locators

Advantages

• Established norm in pipe locating
• Very reliable
• Moderate to moderate-high price ($700–$6000)
• Many manufacturers
Disadvantages

• Does not work on all pipe types
• Signal jumping
• Sensitive to abuse
• Learning curve varies
Locator Basics (cont’d)

• Signal Theory
  • Transmitter
  • Receiver
  • Frequencies
Locator Basics (cont’d)

Direct vs. Indirect
• Locating line for indirect connection when hookup is not available

• Two person “Blind Search”
Locator Tips (cont’d)

• Calculating Depth
Exercise

• Locate exposed wire inside
• Locate pipe in various locations around city direct hook-up, indirect, two person blind, calculate depth, more direct methods.
Acoustic Locators

- Mechanical
- Hydraulic

Operation initiated by introducing noise to the pipe.

Very sensitive listening devices used to locate pipes
Acoustic Advantages

• Able to locate all varieties of pipe
• Can also detect leaking valves and pipes
• Owned leak detection equipment may offset part of price
• Simple to operate
Acoustic Disadvantages

- Moderate/high price $3000–$5000
- Operation dependent on pipe type, size, and soil type, condition, and depth
- Outside noises may affect
- Air in line or leaks may dampen pulses
- Hammer may affect older pipes
Ground Penetrating Radar (GPR)

- Uses microwave band pulses to get images with different dielectric constants.
- Returns signal much like a fish finder
Advantages

• Locates all types of pipe and sizes
• Potential to locate very deep pipe (to 35')
• Very reliable
Disadvantages

- High Cost ($25,000–$35,000)
- Moisture reduces depth capabilities
- Fairly long learning curve
Questions?

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